

Avoid Over Polishing MT Ferrule & How to Control the MT Angle

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Purpose

To ensure consistence good insertion loss, and 3D geometry on the MT ferrule, it is very important to have good polishing process for the MT ferrule. When it comes to MT 8° angle ferrule polishing, it is more criterial because MT angle ferrule's endface should have non-polished area (*flat surface*) and polished area (*angle surface*). As per the IEC 61754-7, maximum non-polished (flat area) allowed is 0.8mm in size (*approximately 30% non-polished area*) and there is no minimum non-polished area (*flat surface*) defined in the IEC 61754-7. Both the non-polished (*flat*) and polished area (*angle area*) surface sizes are needed to controlled in order to achieve good insertion loss.

Overview

The scope of this document to explain how to avoid over polishing on the MT ferrule and ensure that good insertion loss can be achieved by doing good polishing.

Ferrule Size After Polishing

As per the IEC 61754-7, total maximum MT ferrule length is 8.1mm. To ensure good insertion loss, Senko recommend to have ferrule length $\geq 7.8\text{mm}$ after polishing. If over polishing is done, ferrule can be grinded too much and hence it can cause higher insertion loss. See image to the right to understand total ferrule length definition.

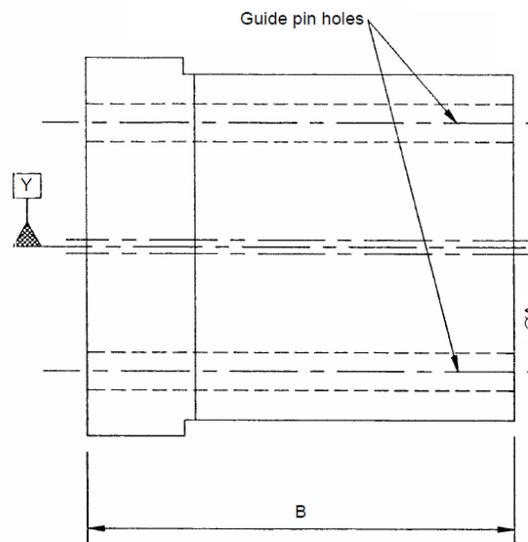


Figure A: Shows the total length of ferrule: aAfter polishing, it should be $\geq 7.8\text{mm}$.

MT Angle Polishing

MT angle ferrule polishing is different than flat MT Polishing. MT angle ferrule should have non polished (*flat*) surface and polished surface (*angle area*) after the polishing.

Step 1 - Endface After Creating Angle

Un-Polished (Flat area) on the MT ferrule.

Polished Angle Area: Polished area approximately appx 70% after creating angle

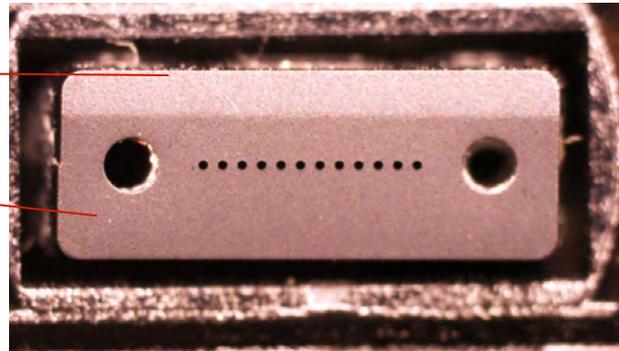


Figure B: Shows the un-polished area and polished area (angle area) on the MT ferrule endface after 1st step (Creating angle). Around 30% area is Non-polished.

Un-polished area. (*Flat area*)

Angle Area: 8 degree

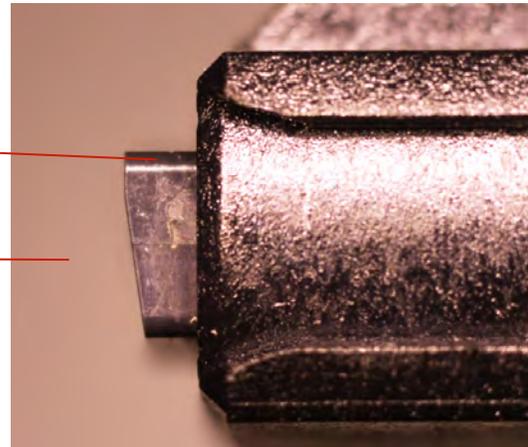


Figure C: Shows another view of ferrule where unpolished area and angle area can be seen.

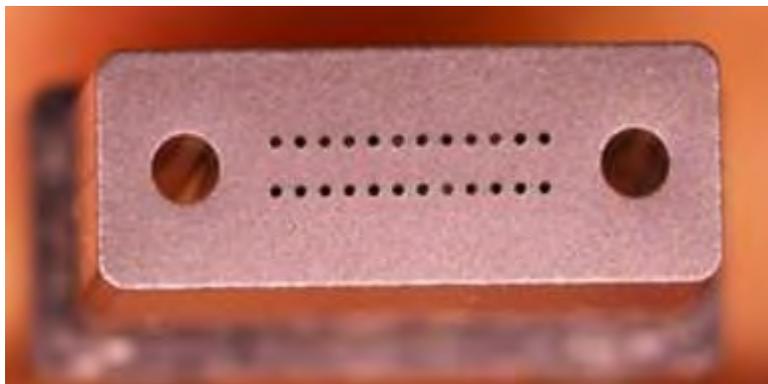


Figure D: Shows 100% polished surface as bad example

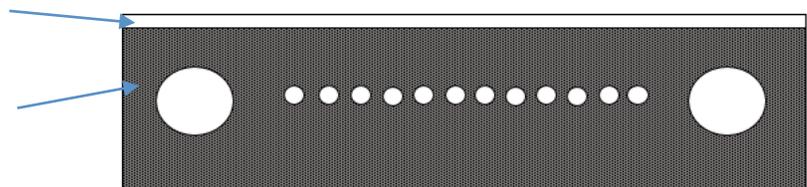
100% surface polished

Step 2- Final Results, Endface After Protrusion

The silicon 3um polishing film which is Step 2 should produce about 75-80% angle-polished surface area. The rest of the polishing steps should yield a polished area that extends to roughly 85-90% across the face of the ferrule. Note that 85-90% (0.3mm to 0.5mm un polished area) is ideal but 70 to 95% is also acceptable.

Un-polished (*flat area*) approx 15%
(0.5-0.3mm in size)

Ideally 85-90% polished surface area
for SM 8° MT Ferrule



After the MT angle ferrule polishing, Senko highly recommended to have un-polished surface (*flat area*) and angle surface on the MT ferrule endface. Senko recommended to have 0.5mm ~ 0.3mm unpolished area which is approximately 10-15% of the total ferrule surface. If operator follow the proper the epoxy injection, control the bead size, and follow Senko recommended polishing procedure, these flat surface and angle surface can be effectively controlled. The angle area (*polished area*) is approximately 85% of the whole ferrule surface

Note 1: Epoxy bead is important to control to achieve un-polished (*flat area*) and polished area. See Senko Engineering Application note “Epoxy Bead Control”.

Note 2: If the ferrule is non pre-angle, see Senko Engineering Application note “How to Polish MT-SM Angle Polishing Directly on Angle Fixture”.